DELAYED STORAGE OF COOKIES WITH APPROVAL CAPABILITY

BACKGROUND OF THE INVENTION

5   **1.   Technical Field:**

The present invention relates generally to an improved data processing system. Still more particularly, the present invention relates to the storage of cookie files on a user's computer system.

10

2.   Description of Related Art:

The Internet, also referred to as an "internetwork", is a set of computer networks, possibly dissimilar, joined together by means of gateways that handle data transfer

15   and the conversion of messages from protocols of the sending network to the protocols used by the receiving network (with packets if necessary). When capitalized, the term "Internet" refers to the collection of networks and gateways that use the TCP/IP suite of protocols.

20   The Internet has become a cultural fixture as a source of both information and entertainment. Many businesses are creating Internet sites as an integral part of their marketing efforts, informing consumers of the products or services offered by the business or providing

25   other information seeking to engender brand loyalty. Many federal, state, and local government agencies are also employing Internet sites for informational purposes, particularly agencies, which must interact with virtually all segments of society such as the Internal Revenue

30   Service and secretaries of state. Providing informational guides and/or searchable databases of online public records may reduce operating costs. Further, the Internet

is becoming increasingly popular as a medium for
commercial transactions.

Currently, the most commonly employed method of
transferring data over the Internet is to employ the World

5   Wide Web environment, also called simply "the Web". Other
Internet resources exist for transferring information,
such as File Transfer Protocol (FTP) and Gopher, but have
not achieved the popularity of the Web. In the Web
environment, servers and clients effect data transaction

10 using the Hypertext Transfer Protocol (HTTP), a known
protocol for handling the transfer of various data files
(e.g., text, still graphic images, audio, motion video,
etc.). The information in various data files is formatted
for presentation to a user by a standard page description

15 language, the Hypertext Markup Language (HTML). In
addition to basic presentation formatting, HTML allows
developers to specify "links" to other Web resources
identified by a Uniform Resource Locator (URL). A URL is
a special syntax identifier defining a communications path

20 to specific information. Each logical block of
information accessible to a client, called a "page" or a
"Web page", is identified by a URL. The URL provides a
universal, consistent method for finding and accessing
this information, not necessarily for the user, but mostly

25 for the user's Web "browser". A browser is a program
capable of submitting a request for information identified
by an identifier, such as, for example, a URL. A user may
enter a domain name through a graphical user interface
(GUI) for the browser to access a source of content. The

30 domain name is automatically converted to the Internet
Protocol (IP) address by a domain name system (DNS), which
is a service that translates the symbolic name entered by
the user into an IP address by looking up the domain name

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in a database. The HTML file also contains data, which may not be displayed at the browser. This "hidden" data may be used to store information or execute programs without the user's knowledge of the existence or purpose
5   of the information or program.

A hidden data field, which may be included in the HTTP header of an HTML file, is a "cookie" data field. A cookie is an HTTP protocol header document element, which may be used to provide multiple data elements to the
10 browser. Server sites do one of three things: (1) does not send cookies; (2) sends transient cookies; and (3) sends persistent cookies. Some cookies may be specified by the server site as persistent, implying that they will be stored on the user's hard drive and remain available
15 even if the user closes the browser or reboots the machine. Other cookies are transient and will only persist while the current browser session is open. In response to receiving an HTML file with a cookie, the browser may store the cookie data elements in a file,
20 which are usually kept in a profile directory for the browser. Also, a different cookie file may be present for each user profile (e.g. each person in a family can have their own profile on the same computer with their own cookie file). These cookie data elements are also
25 referred to as "cookies". Once a cookie is sent to the browser computer, the server expects the cookie to be returned in the HTTP header of subsequent messages sent from the browser to the server. The inclusion of the cookie in the HTTP header of messages from the browser is
30 done without the user's awareness. In this manner, the operator of the server may identify repeat visitors to the server site.

The Internet also is widely used to transfer

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applications to users using browsers. With respect to
commerce on the Web, individual consumers and businesses
use the Web to purchase various goods and services. Some
companies offer goods and services solely on the Web while
5   others use the Web to extend their reach. A cookie
provides a way for a Web site to keep track of a user's
patterns and preferences, and potentially store the cookie
on the user's computer. The storage of a cookie may be
the unauthorized storage of data on another user's
10   computer. The cookie may be used for tracking the user
and his or her requests for information from the server
site without the user's knowledge or permission.

Browsers typically accept all cookies as a default
option. A browser also may allow a user to disable the
15   acceptance of cookies entirely. The browser may include
an option to determine whether to accept cookies. While
this option disables the acceptance of cookies, this
option does notify a user that a cookie was detected. A
browser may also accept all cookies, but only return
20   cookies to the originating site. Browsers also have an
"ask me each time" option. This option asks a user
whether to accept a cookie every time a cookie is
presented for acceptance. This option, however, becomes
tiresome quickly. A user may receive three or four
25   pop-ups on every Web page in which a yes or no response
is required.

Some Web sites may not function properly when the
acceptance of cookies is disabled by the browser.
Therefore, a user may not be able to access a Web site
30   without having cookies accepted by the browser.

The user basically has two options: 1) disable
cookies and then not be able to talk to a vast number of
Web sites (many of which the user trusts and does not

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care if cookies are sent) or 2) enable cookies and get all of the downside of cookies.

Therefore, it would be advantageous to have an improved method and apparatus for managing acceptance and

5   storage of cookies on a data processing system.

SUMMARY OF THE INVENTION

5   The present invention provides a method, apparatus, and computer instructions for managing cookies in a data processing system. A cookie is received during a browser program session. The cookie is only stored in a temporary data store within the data processing system
10   for a duration of the browser program session. The cookies stored in the temporary data store may be displayed in response to a signal to terminate the browser program session. Cookies are selectively stored in a persistent storage, based on user input.

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BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed characteristic of the
5   invention are set forth in the appended claims. The
invention itself, however, as well as a preferred mode of
use, further objectives and advantages thereof, will best
be understood by reference to the following detailed
description of an illustrative embodiment when read in
10   conjunction with the accompanying drawings, wherein:

Figure 1 is a pictorial representation of a data
processing system in which the present invention may be
implemented in accordance with a preferred embodiment of
the present invention;

15   **Figure 2** is a block diagram of a data processing
system in which the present invention may be implemented;

Figure 3 is a block diagram of a browser program in
accordance with a preferred embodiment of the present
invention;

20   **Figure 4** is a diagram of components used in managing
receipt and storage of cookies in accordance with a
preferred embodiment of the present invention;

Figure 5 is a menu displaying a list of cookies in
which the present invention may be implemented;

25   **Figure 6** is a flowchart of process for managing
receipt of cookies in accordance with a preferred
embodiment of the present invention; and

Figure 7 is a flowchart of method for processing
cookies in accordance with a preferred embodiment of the
30   present invention.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the figures and in particular
5   with reference to **Figure 1**, a pictorial representation of
a data processing system in which the present invention
may be implemented is depicted in accordance with a
preferred embodiment of the present invention.   A
computer **100** is depicted which includes a system unit
10   **102**, a video display terminal **104**, a keyboard **106**,
storage devices **108**, which may include floppy drives and
other types of permanent and removable storage media, and
mouse **110**. Additional input devices may be included with
personal computer **100**, such as, for example, a joystick,
15   touchpad, touch screen, trackball, microphone, and the
like. Computer **100** can be implemented using any suitable
computer, such as an IBM RS/6000 computer or
IntelliStation computer, which are products of
International Business Machines Corporation, located in
20   Armonk, New York. Although the depicted representation
shows a computer, other embodiments of the present
invention may be implemented in other types of data
processing systems, such as a network computer. Computer
100 also preferably includes a graphical user interface
25   that may be implemented by means of systems software
residing in computer readable media in operation within
computer **100**.

With reference now to **Figure 2**, a block diagram of a
data processing system is shown in which the present
30   invention may be implemented. Data processing system **200**
is an example of a computer, such as computer **100** in
Figure 1, in which code or instructions implementing the

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processes of the present invention may be located. Data processing system **200** employs a peripheral component interconnect (PCI) local bus architecture. Although the depicted example employs a PCI bus, other bus

5   architectures such as Accelerated Graphics Port (AGP) and Industry Standard Architecture (ISA) may be used. Processor **202** and main memory **204** are connected to PCI local bus **206** through PCI bridge **208**. PCI bridge **208** also may include an integrated memory controller and cache

10   memory for processor **202**. Additional connections to PCI local bus **206** may be made through direct component interconnection or through add-in boards. In the depicted example, local area network (LAN) adapter **210**, small computer system interface (SCSI) host bus adapter **212**, and

15   expansion bus interface **214** are connected to PCI local bus **206** by direct component connection. In contrast, audio adapter **216**, graphics adapter **218**, and audio/video adapter **219** are connected to PCI local bus **206** by add-in boards inserted into expansion slots. Expansion bus interface

20   **214** provides a connection for a keyboard and mouse adapter **220**, modem **222**, and additional memory **224**. SCSI host bus adapter **212** provides a connection for hard disk drive **226**, tape drive **228**, and CD-ROM drive **230**. Typical PCI local bus implementations will support three or four PCI

25   expansion slots or add-in connectors.

An operating system runs on processor **202** and is used to coordinate and provide control of various components within data processing system **200** in **Figure 2**. The operating system may be a commercially available operating

30   system such as Windows 2000, which is available from Microsoft Corporation. An object oriented programming system such as Java may run in conjunction with the

operating system and provides calls to the operating
system from Java programs or applications executing on
data processing system **200**. "Java" is a trademark of Sun
Microsystems, Inc. Instructions for the operating system,

5   the object-oriented programming system, and applications
or programs are located on storage devices, such as hard
disk drive **226**, and may be loaded into main memory **204** for
execution by processor **202**.

Those of ordinary skill in the art will appreciate

10   that the hardware in **Figure 2** may vary depending on the
implementation. Other internal hardware or peripheral
devices, such as flash ROM (or equivalent nonvolatile
memory) or optical disk drives and the like, may be used
in addition to or in place of the hardware depicted in

15   **Figure 2**. Also, the processes of the present invention
may be applied to a multiprocessor data processing
system.

For example, data processing system **200**, if
optionally configured as a network computer, may not

20   include SCSI host bus adapter **212**, hard disk drive **226**,
tape drive **228**, and CD-ROM **230**, as noted by dotted line
232 in **Figure 2** denoting optional inclusion. In that
case, the computer, to be properly called a client
computer, must include some type of network communication

25   interface, such as LAN adapter **210**, modem **222**, or the
like. As another example, data processing system **200** may
be a stand-alone system configured to be bootable without
relying on some type of network communication interface,
whether or not data processing system **200** comprises some

30   type of network communication interface. As a further
example, data processing system **200** may be a personal
digital assistant (PDA), which is configured with ROM

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and/or flash ROM to provide nonvolatile memory for storing operating system files and/or user-generated data.

The depicted example in **Figure 2** and above-described

5 examples are not meant to imply architectural limitations. For example, data processing system **200** also may be a notebook computer or hand held computer in addition to taking the form of a PDA. Data processing system **200** also may be a kiosk or a Web appliance.

10 The processes of the present invention are performed by processor **202** using computer implemented instructions, which may be located in a memory such as, for example, main memory **204**, memory **224**, or in one or more peripheral devices **226-230**.

15 Turning next to **Figure 3**, a block diagram of a browser program is depicted in accordance with a preferred embodiment of the present invention. A browser is an application used to navigate or view information or data in a distributed database, such as the Internet or

20 the World Wide Web.

In this example, browser **300** includes a user interface **302**, which is a graphical user interface (GUI) that allows the user to interface or communicate with browser **300**. This interface provides for selection of

25 various functions through menus **304** and allows for navigation through navigation **306**. For example, menu **304** may allow a user to perform various functions, such as saving a file, opening a new window, displaying a history, and entering a URL. Navigation **306** allows for a

30 user to navigate various pages and to select web sites for viewing. For example, navigation **306** may allow a user to see a previous page or a subsequent page relative

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to the present page. Preferences such as those illustrated in **Figure 3** may be set through preferences **308**.

5　　　Communications **310** is the mechanism with which browser **300** receives documents and other resources from a network such as the Internet. Further, communications **310** is used to send or upload documents and resources onto a network. In the depicted example, communication **310** uses HTTP. Other protocols may be used depending on

10　the implementation. The mechanism of the present invention may be implemented as processes within communication **310** to manage cookies as they are received for storage from sources, such as Web sites that send documents and other content to a user of browser **300**.

15　　　Documents that are received by browser **300** are processed by language interpretation **312**, which includes an HTML unit **314** and a JavaScript unit **316**. Language interpretation **312** will process a document for presentation on graphical display **318**. In particular,

20　HTML statements are processed by HTML unit **314** for presentation while JavaScript statements are processed by JavaScript unit **316**.

　　　Graphical display **318** includes layout unit **320**, rendering unit **322**, and window management **324**. These

25　units are involved in presenting web pages to a user based on results from language interpretation **312**.

　　　Browser **300** is presented as an example of a browser program in which the present invention may be embodied. Browser **300** is not meant to imply architectural

30　limitations to the present invention. Presently available browsers may include additional functions not shown or may omit functions shown in browser **300**. A browser may

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be any application that is used to search for and display content on a distributed data processing system. Browser **300** make be implemented using known browser applications, such as Netscape Navigator or Microsoft Internet

5   Explorer. Netscape Navigator is available from Netscape Communications Corporation while Microsoft Internet Explorer is available from Microsoft Corporation.

The present invention accepts all cookies with an only-return-to-originator option if desired. The browser

10 will basically tell the server that it is accepting and storing all persistent cookies on the hard drive. Thus, the server sees no difference. The browser, however, does not actually write these persistent cookies to the file until later. The user may then view the list of

15 cookies that are scheduled to be written and choose to save or discard them. If the browser closes before writing the cookies, they are all discarded. Not writing cookies simply makes the server think the user is a first-time visitor the next time the user visits that

20 site, which likely is the precise intent of the user.

With reference to **Figure 4,** a diagram of components used in managing receipt and storage of cookies is depicted in accordance with a preferred embodiment of the present invention. The browser issues a request to a

25 server and the server responds with a response. The response may contain a cookie, and the accepted protocol is that the browser will dutifully keep up with that cookie (either permanently or temporarily as specified by the type of cookie). Response **400** may be sent to browser

30   **402.** In these examples, response **400** is a HTTP response made in response to browser **402.** When response **400** contains cookie **404,** cookie **404** may be stored in permanent

storage **406** or in temporary memory **408**. In these examples, memory **408** is system memory in a data processing system, such as main memory **204** in **Figure 2**. Memory **408** is used as a temporary data store in these examples. When

5   stored in permanent storage **406**, cookie **404** is typically placed in a file, such as cookie file **410** for use by browser **402**. Permanent storage **406** may take various forms depending on the implementation, such as, for example, hard disk drive, an optical disc, or a flash memory.

10   Normally, browser **402** receives a request, such as response **400** to accept cookie **404**. Upon accepting cookie **404**, this cookie is normally placed into cookie file **410** as well as in temporary memory **408** for use during the session in which the user makes requests through browser

15   **402** for various content, such as Web pages, audio files, or images. A session is the time from which browser **402** starts execution to the time at which browser **402** terminates execution.

The present invention provides a method, apparatus,

20   and computer implemented instructions for handling cookies received at browser **402**. This invention does not address the transient cookies, only the persistent cookies. The mechanism of the present invention accepts all cookies presented to browser **402** without saving all of the cookies

25   in permanent storage **406**. The cookies are stored in temporary memory **408** in this example for use while browser **402** is executing. When execution of browser **402** is to be terminated all cookies within temporary storage are presented to a user. Selected cookies may be stored in

30   cookie file **410** within permanent storage **406** in response to a user input selecting these cookies for retention. Other cookies within temporary memory **408** are discarded.

With reference to **Figure 5,** a menu displaying a list
of cookies is shown in which the present invention may be
implemented. Menu **500** includes check boxes **502-510**
associated with fields **512-520** with each field identifying

5   a cookie that has been received during the current
session. In these examples, the identifications of
cookies in fields **512-520** are obtained from the URLs for
the source of the cookies. Of course other identifiers
may be used depending on the particular implementation.

10 In this example, the user accepts a cookie that has
been passed to the user's computer system by entering a
mark in a check box next to the cookie to be permanently
stored. Cookies not marked by the user in menu **500** are
discarded. In this manner, the user is able to store the

15 selected cookies and disregard the rest of the cookies.
The user may decide to save all of the cookies, some of
the cookies, or none of the cookies through menu **500**.
When the user has finished making selections in menu **500**,
those selections may be accepted by pressing "Okay" button

20 **522**. The selections may be discarded by pressing "Cancel"
button **524**.

Turning to **Figure 6,** a flowchart of a process for
managing receipt of cookies is depicted in accordance with
a preferred embodiment of the present invention. The

25 process illustrated in **Figure 6** may be implemented in a
browser, such as browser **300** in **Figure 3**.

During the current session, a determination is made
as to whether a cookie has been received (step **600**). If a
cookie is not received, the process returns to step **600**.

30 When a cookie is received, the cookie is prevented from
being permanently stored in a cookie file (step **602**). The
cookie is stored in a temporary storage, such as a

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temporary file or temporary memory **408** in **Figure 4**. In
these examples, the cookie is not stored in a file
normally used to retain cookies for the browser. The
cookie is tagged as accepted (step **606**). A protocol is
5   present that is used by the browser/server to determine
capabilities. However, once the capabilities have been
established and the browser has indicated that it accepts
cookies, then the server simply sends them with the
understanding that the browser is going to handle them.
10   This handling of the cookie allows for it to be used in
requests made to a Web site, dependent upon that cookie,
to operate properly. A determination is made as to
whether the current session has been requested to be
terminated (step **608**). The session terminates when the
15   execution of the browser ends. Execution of the browser
ends, in these examples, when the user clicks "close". If
the current session is not in the act of being terminated,
process returns to step **600** as described above.
Otherwise, the cookies are processed (step **610**). Step **610**
20   happens once the browser has requested to close the
session, but before the browser is actually terminated.
The processing of the cookies involves presenting received
cookies to the user to determine which cookies, if any,
should be retained. The user may request to process the
25   cookie list at any time and continue to use the browser
afterwards. Closing the browser forces the processing of
the cookies using the mechanism of the present invention.
A user option is present to initiate these processes at
any other time.
30   As represented in **Figure 7**, a flowchart of a method
for processing cookies is depicted in accordance with a
preferred embodiment of the present invention. The

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process depicted in **Figure 7** is a more detailed
description of step **610** in **Figure 6**.

The process begins by generating a list of cookies
received in the current session (step **700**). The list of
5   cookies from the current session is displayed to the user
(step **702**). User input is received to indicate which
cookies to store in a permanent storage, such as
permanent storage **406** in **Figure 4** (step **704**). The
cookies marked for permanent storage, as depicted in
10   **Figure 5**, are identified (step **706**). The identified
cookies are then saved in permanent storage, a cookie
file, database, registry, or wherever the browser stores
persistent data (step **708**). Cookies that are not marked
for permanent storage are discarded (step **710**) with the
15   process terminating thereafter.

Thus, the present invention provides a method,
apparatus, and computer implemented instructions to delay
the permanent storage of cookies received from another
computer until the user approves the permanent storage.
20   The mechanism of the present invention affords the user
the opportunity to view and approve the permanent storage
of cookies on the user's computer. The mechanism accepts
cookies or tag cookies as accepted is needed so that Web
sites, which need the cookies, can function properly.
25   The cookies are temporarily stored so that the data from
the cookie is available to a Web site to allow the user
to properly access Web sites requiring cookies. When the
session for the browser terminates, part of the
termination of the session includes presenting cookies
30   received during the session to the user for a
determination as to which cookie should be retained.
Thus, the present invention provides a mechanism to

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restrict access to resources on a user's computer. In
this manner, the user is not required to approve the
acceptance of a cookie each time a cookie is presented to
the browser as in currently available systems.

5   It is important to note that while the present
invention has been described in the context of a fully
functioning data processing system, those of ordinary
skill in the art will appreciate that the processes of
the present invention are capable of being distributed in

10   the form of a computer readable medium of instructions
and a variety of forms and that the present invention
applies equally regardless of the particular type of
signal bearing media actually used to carry out the
distribution. Examples of computer readable media

15   include recordable-type media, such as a floppy disk, a
hard disk drive, a RAM, CD-ROMs, DVD-ROMs, and
transmission-type media, such as digital and analog
communications links, wired or wireless communications
links using transmission forms, such as, for example,

20   radio frequency and light wave transmissions. The
computer readable media may take the form of coded
formats that are decoded for actual use in a particular
data processing system.

       The description of the present invention has been

25   presented for purposes of illustration and description,
and is not intended to be exhaustive or limited to the
invention in the form disclosed. Many modifications and
variations will be apparent to those of ordinary skill in
the art. In the depicted examples, the cookie is

30   presented as part of an HTTP request received at the
browser. The mechanism of the present invention may be
applied to other methods used to send cookies to a
browser. For example, cookies embedded within HTML pages

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or Java scripts also may be handled using the process of
the present invention. In each case, the cookies will be
accepted and placed in a temporary storage and not in a
permanent storage without approval from the user at a
5   time when the session ends. Of course, this presentation
and approval process may occur at other times other than
the termination of the session depending on the
particular implementation. For example, the user may
initiate an approval or review process of cookies
10   received during a session.

Further, the illustrated examples place the cookies
in a temporary memory, such as a system random access
memory. These cookies received during a session also may
be placed in a other types of temporary storage, such as
15   a temporary file that is deleted or emptied when the
session terminates. The embodiment was chosen and
described in order to best explain the principles of the
invention, the practical application, and to enable
others of ordinary skill in the art to understand the
20   invention for various embodiments with various
modifications as are suited to the particular use
contemplated.